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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/759,171	01/16/2001	Lothar Zimmermann	P20465	9812

7055 7590 11/13/2002

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EXAMINER
JIMENEZ, MARC QUEMUEL

ART UNIT	PAPER NUMBER
3726	

DATE MAILED: 11/13/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/759,171	ZIMMERMANN, LOTHAR	
	Examiner	Art Unit	
	Marc Jimenez	3726	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 August 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22 and 24-51* is/are pending in the application.

4a) Of the above claim(s) *24-46 and 48-51* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22 and 47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 9 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 8/30/2002 has been considered by the examiner.

Election/Restrictions

2. The restriction requirement made final in the last office action is herein maintained.

Applicant argues that claim 1 recites a covering layer which is disposed on the roll core while independent claim 24 recites that the covering layer is applied on the roll core and neither claim precludes inserting the roll core into the covering layer because the term "applying" is clearly broad enough to include "inserting the roll core into the sleeve". However, it is noted that claim 1 does not require "an elastic covering layer" as recited in claim 24, therefore, the product can be made without an elastic covering layer. Furthermore, claim 1 requires that the thermoplastic has a melting temperature which is below a glass transition temperature of the at least one thermosetting plastic, however, claim 24 does not require that the thermoplastic have a melting temperature below the glass transition temperature of the at least one thermosetting plastic. Therefore, the process can be used to make a product having different thermoplastic and thermosetting properties.

3. This application contains claims 24-46 and 48-51 drawn to an invention nonelected with traverse in Paper No. 7. A complete reply to the final rejection must include cancelation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 1-8, 12, 13, 16-18, 20, 21, and 47** are rejected under 35 U.S.C. 102(b) as being anticipated by Holroyd et al. (2,534,818).

Holroyd et al. teach a roll for smoothing a web comprising: a hard metal (col. 3, line 37) roll core **10** having an outer surface, a covering layer **12** disposed on the outer surface of the roll core **10**, the covering layer **12** having an inner surface and an outer surface, the covering layer **12** comprising at least one thermosetting plastic (col. 2, line 17 and col. 4, lines 64-68) and at least one thermoplastic (col. 2, line 20 and col. 4, lines 68-70), wherein the at least one thermoplastic has a melting temperature which is below a glass transition temperature of the at least one thermosetting plastic (col. 4, lines 64-71). In col. 4, lines 64-71, Holroyd et al. gives examples of thermoplastics that could be used, namely: acrylic resin such as polymethyl methacrylate, or Kandar, polystyrene or polyvinyl butyral. Holyroyd et al. also give examples of thermosetting resins that could be used, namely: melamine-formaldehyde, urea-formaldehyde, a polyester resin, an alkyd resin, or styrene-maleic anhydride copolymer resin. It is noted that if the thermoplastic that was used was "acrylic resin" (which has a melting temperature of 130degrees C, see physical properties of acrylic resin attached to this office action) and the thermosetting

resin that was used was "styrene-maleic anhydride copolymer resin" (which has a glass transition temperature of 155 degrees C, see physical properties of styrene-maleic anhydride copolymer resin attached to this office action), the thermoplastic has a melting temperature (130degrees C) which is below a glass transition temperature of the thermosetting plastic (155 degrees C). Furthermore, applicant has submitted a "Plastics Chooser Chart" to show that one of ordinary skill in the art is well aware of both thermoplastics and thermosetting plastics and such a skilled person also knows the particular properties of such plastic types, wherein polyester resin, a thermosetting, is listed along with acrylic, which is a thermoplastic. Applicant also states that each of the commonly known materials would suffice to practice the instant invention (see page 10 of applicant's response filed 8/30/02, paper #9). Therefore, since Holroyd et al. teach using a polyester resin (col. 4, line 66) and an acrylic (col. 4, line 69), Holyroyd et al. inherently teaches that the thermoplastic has a melting temperature which is below a glass transition temperature of the thermosetting plastic.

Note that the covering layer **12** comprises a matrix material and wherein one of fillers and fibers (col. 3 lines 67-75 to col. 4, lines 1-5) are embedded in the matrix material. The amount of thermosetting plastic is greater than the amount of thermoplastic (col. 3, lines 14-18). The claimed proportions of thermosetting plastic to thermoplastic is shown at col. 3, lines 14-18.

The web being a paper web does not further limit the structure of the roll and has not been given patentable weight.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. **Claims 9-11, 14, 15, 19, and 22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Holroyd et al.

With respect to Claims 9-11, Holroyd et al. teach the invention cited above with the exception of using at least two different thermoplastics and at least two different thermosetting plastics.

At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to use at least two different thermoplastics and at least two different thermosetting plastics because applicant has not disclosed that using at least two different thermoplastics and at least two different thermosetting plastics provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected applicant's invention to perform equally well with either one thermoplastic and one thermosetting plastic as taught by Holroyd et al. or the claimed at least two different thermoplastics and at least two different thermosetting plastics because both combinations perform the same function of providing a layer that work equally as well considering the desired heat resistance on the surface of the roll.

With respect to Claims 14 and 15, Holroyd et al. teach the invention cited above with the

exception of the mixture ratio varying over a radial thickness of the covering layer.

At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to have provided a mixture ratio that varies over a radial thickness of the covering layer because applicant has not disclosed that a mixture ratio that varies over a radial thickness of the covering layer provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected applicant's invention to perform equally well with either mixture ratio as taught by Holroyd et al. or the claimed mixture ratio that varies over a radial thickness of the covering layer because both mixture ratios perform the same function of providing a layer that work equally as well considering the desired heat resistance on the surface of the roll.

With respect to Claims 19 official notice is taken that it is well known in the art to use the claimed reinforcing fibers.

With respect to Claim 22, Holroyd et al. teach the invention cited above with the exception of using powdered fillers.

At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to have used powdered fillers because applicant has not disclosed powdered fillers provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected applicant's invention to perform equally well with either the fibers taught by Holroyd et al. or the claimed powdered fillers because both fillers perform the same function of providing a reinforcement equally as well considering the desired reinforcement of the surface layer.

Response to Arguments

8. Applicant's arguments filed 8/30/02 have been fully considered but they are not persuasive.

9. In response to applicant's argument that the roll is used for smoothing a web, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

10. Applicant has not submitted convincing evidence to rebut the inherency feature in Holroyd et al. that the thermoplastic has a melting temperature below a glass transition temperature of the thermosetting plastic (see also rejections above), therefore the examiner maintains the 102(b) rejection of the previous office action. See also the attached properties of the thermoplastic and thermosetting plastic used by Holroyd et al. wherein the thermoplastic (for example acrylic with a melting temperature of 130degrees C) has a melting temperature less than the glass transition temperature of the thermosetting plastic (for example styrene-maleic anhydride copolymer resin which has a glass transition temperature of 155 degrees C).

11. Applicant's arguments with respect to dependent claims 2-22 fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references. Furthermore, applicant has not properly rebutted the

design choice rejections in the last office action, therefore the examiner maintains the design choice rejections.

Conclusion

12. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Interviews After Final

13. Applicant note that an interview after a final rejection will not be granted unless the intended purpose and content of the interview is presented briefly, in writing (the agenda of the interview must be in writing) to clarify issues for appeal requiring only nominal further consideration. Interviews merely to restate arguments of record or to discuss new limitations will be denied. See MPEP 714.13 and 713.09.

Contact Information

14. Telephone inquiries regarding the status of applications or other general questions, by persons entitled to the information, should be directed to the group clerical personnel. In as much as the official records and applications are located in the clerical section of the examining groups, the clerical personnel can readily provide status information. M.P.E.P. 203.08. The Group clerical receptionist number is (703) 308-1148.

If in receiving this Office Action it is apparent to applicant that certain documents are missing, e.g., copies of references cited, form PTO-1449, form PTO-892, etc., requests for copies of such papers or other general questions should be directed to Tech Center 3700 Customer Service at (703) 306-5648, or fax (703) 872-9301 or by email to CustomerService3700@uspto.gov.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc Jimenez whose telephone number is **703-306-5965**. The examiner can normally be reached on **Monday-Thursday and the second Friday of the bi-week, between 9am-6pm**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Greg Vidovich can be reached on 703-308-1513. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9302 for regular communications and 703-872-9303 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1148.

Other helpful telephone numbers are listed for applicant's benefit.

Allowed Files & Publication	(703) 308-6789 or (888) 786-0101
Assignment Branch	(703) 308-9723
Certificates of Correction	(703) 305-8309
Drawing Corrections/Draftsman	(703) 305-8404/8335
Petitions/Special Programs	(703) 305-9285
Terminal Disclaimers	(703) 305-8408
PCT Help Desk	(703) 305-3257

If the information desired is not provided above, or a number has been changed, please call the general information help line below.

Information Help line	1-800-786-9199
Internet PTO-Home Page	http:www.uspto.gov/

MJ

MJ
November 6, 2002

AU 3726

MatWeb.com, The Online Materials Database

Overview - Acrylic, General Purpose, Molded

Subcategory: Acrylic; Polymer; Thermoplastic

Close Analogs: Click the button to view the proprietary polymer grades listed in MatWeb that belong to this class. Please be aware that some proprietary polymers may not be listed because they fall into more than one class or because of ambiguity in manufacturer's information.

Proprietary Grades

Key Words: PMMA; Polymethyl Methacrylate; Polymethylmethacrylate; Plastics, Polymers

The property data has been taken from proprietary materials in the MatWeb database. Each property value reported is the average of appropriate MatWeb entries and the comments report the maximum, minimum, and number of data points used to calculate the value. The values are not necessarily typical of any specific grade, especially less common values and those that can be most affected by additives or processing methods.

Physical Properties	Metric	English	Comments
Density	1.15 - 1.19 g/cc	0.0415 - 0.043 lb/in³	Average = 1.18 g/cc; Grade Count = 51
Water Absorption	0.3 - 2 %	0.3 - 2 %	Average = 0.85%; Grade Count = 27
Moisture Absorption at Equilibrium	0.3 - 0.33 %	0.3 - 0.33 %	Average = 0.3%; Grade Count = 16
Linear Mold Shrinkage	0.003 - 0.0065 cm/cm	0.003 - 0.0065 in/in	Average = 0.0047 cm/cm; Grade Count = 30
Melt Flow	0.9 - 27 g/10 min	0.9 - 27 g/10 min	Average = 6.2 g/10 min; Grade Count = 45
Mechanical Properties			
Hardness, Rockwell M	63 - 97	63 - 97	Average = 90.6; Grade Count = 26
Tensile Strength, Ultimate	47 - 79 MPa	6820 - 11500 psi	Average = 68.7 MPa;

			Grade Count = 41
Tensile Strength, Yield	55 - 85 MPa	7980 - 12300 psi	Average = 73.5 MPa; Grade Count = 11
Elongation @ break	1 - 30 %	1 - 30 %	Average = 6%; Grade Count = 48
Elongation @ Yield	4 - 5 %	4 - 5 %	Average = 4.5%; Grade Count = 11
Tensile Modulus	2.2 - 3.8 GPa	319 - 551 ksi	Average = 3.1 GPa; Grade Count = 33
Flexural Modulus	3 - 3.5 GPa	435 - 508 ksi	Average = 3.3 GPa; Grade Count = 23
Flexural Yield Strength	81 - 138 MPa	11700 - 20000 psi	Average = 110 MPa; Grade Count = 31
Compressive Yield Strength	100 - 117 MPa	14500 - 17000 psi	Average = 110 MPa; Grade Count=4
Shear Modulus	1.4 GPa	203 ksi	Grade Count = 3
Izod Impact, Notched	0.12 - 0.2 J/cm	0.225 - 0.375 ft-lb/in	Average = 0.16 J/cm; Grade Count = 23
Izod Impact, Unnotched	2.7 J/cm	5.06 ft-lb/in	Grade Count = 1
Charpy Impact, Unnotched	1.9 - 6 J/cm²	9.04 - 28.6 ft-lb/in²	Average = 2.6 J/cm²; Grade Count = 16
Charpy Impact, Notched	0.2 - 0.4 J/cm²	0.952 - 1.9 ft-lb/in²	Average = 0.24 J/cm²; Grade Count = 16
Gardner Impact	0.23 - 1.4 J	0.17 - 1.03 ft-lb	Average = 0.73 J; Grade Count = 7
Tensile Creep Modulus, 1 hour	1800 - 2700 MPa	261000 - 392000 psi	Average = 2500 MPa; Grade Count = 9
Tensile Creep Modulus, 1000 hours	1200 - 1800 MPa	174000 - 261000 psi	Average = 1600 MPa; Grade

			Count = 10
Electrical Properties			
Electrical Resistivity	1e+014 - 1e+015 ohm-cm	1e+014 - 1e+015 ohm-cm	Average = 1e+15 ohm-cm; Grade Count = 20
Surface Resistance	1e+014 - 1e+016 ohm	1e+014 - 1e+016 ohm	Average = 2E+15 ohm; Grade Count = 19
Dielectric Constant	2.8 - 4	2.8 - 4	Average = 3.2; Grade Count = 23
Dielectric Constant, Low Frequency	3 - 4	3 - 4	Average = 3.5; Grade Count = 23
Dielectric Strength	17.7 - 60 kV/mm	450 - 1520 kV/in	Average = 28.8 kV/mm; Grade Count = 31
Dissipation Factor	0.03 - 0.55	0.03 - 0.55	Average = 0.064; Grade Count = 20
Dissipation Factor, Low Frequency	0.04 - 0.55	0.04 - 0.55	Average = 0.07; Grade Count = 20
Comparative Tracking Index	600 V	600 V	Grade Count=16
Thermal Properties			
CTE, linear 20°C	60 - 130 µm/m-°C	33.3 - 72.2 µin/in-°F	Average = 72.9 µm/m-°C; Grade Count=27
Heat Capacity	1.46 - 1.47 J/g-°C	0.349 - 0.351 BTU/lb-°F	Average = 1.5 J/g-K; Grade Count = 10
Thermal Conductivity	0.19 - 0.24 W/m-K	1.32 - 1.67 BTU-in/hr-ft²-°F	Average = 0.2 W/m-K; Grade Count = 11
Melting Point	130 °C	266 °F	Grade Count = 3
Maximum Service Temperature, Air	41 - 103 °C	106 - 217 °F	Average = 85.8°C; Grade Count = 47

Deflection Temperature at 0.46 MPa (66 psi)	80 - 103 °C	176 - 217 °F	Average = 94.1°C; Grade Count=18
Deflection Temperature at 1.8 MPa (264 psi)	41 - 100 °C	106 - 212 °F	Average = 86.5°C; Grade Count=47
Vicat Softening Point	47 - 117 °C	117 - 243 °F	Average = 94.2°C; Grade Count = 42
Glass Temperature	100 - 105 °C	212 - 221 °F	Average = 100°C; Grade Count = 4
Flammability, UL94	HB	HB	Grade Count = 36
Oxygen Index	18 %	18 %	Grade Count = 7

Optical Properties

Refractive Index	1.49 - 1.498	1.49 - 1.498	Average = 1.49; Grade Count = 25
Haze	1 - 96 %	1 - 96 %	Average = 33.2%; Grade Count = 10
Transmission, Visible	80 - 93 %	80 - 93 %	Average = 89.2%; Grade Count = 42

Processing Properties

Processing Temperature	243 - 250 °C	469 - 482 °F	Average = 240°C; Grade Count = 6

SARTOMER® APPLICATION BULLETIN

SMA® LO Resins: Low Odor, Low VOC Styrene-Maleic Anhydride Copolymer Resins

Introduction

SMA® LO Resins are a new line of resins that demonstrate Sartomer's continuing commitment to delivering products that meet or exceed performance expectations while offering improvements for customers and the environment. These resins are manufactured using a new process that completely eliminates the odor component which is traditionally associated with SMA® Resins, and which reduces the already low content of VOCs. These product improvements are achieved while the structure and properties of the resins are unchanged. Therefore, the SMA® LO Resins are drop-in replacements for the SMA® Resins you currently use, and will deliver the same high level of performance.

What Are LO Grades?

A SMA® Resin with LO at the end of it's grade name designates a resin that has been produced using a new low odor manufacturing process. Sartomer manufactures LO grades of the full line of base resins (SMA® 1000, 2000, 3000, EF30 and EF40) and ester resins (SMA® 1440, 17352, 2625 and 3840). Furthermore, these resins will be supplied in flake (F), powder (P) and aqueous ammonium hydroxide solution (H) form. Therefore, if you currently use a particular grade of SMA® and want to benefit from low odor properties, the resin choice is simple – just order the LO grade. For example, instead of SMA® 1000P, use SMA® 1000P LO.

Product Registration

Since the resin structures are the same, there is no change in CAS number or status in going from SMA® Resins to SMA® LO Resins.

The Benefits Of SMA LO Resins

SMA® LO Resins are manufactured using a process that does not produce even trace quantities of the volatile, odor-causing by-product typically associated with SMA® Resins. Consequently, SMA® LO Resins are ideally suited for use in water-based formulations, such as inks and overprint varnishes for demanding applications and manufacturing processes which can not tolerate solvent odor contamination. Furthermore, elimination of the volatile odor components lowers the VOC content of the resins by as much as 50% in the case of the base resins.

Table. Typical Properties Of SMA® 1000F And SMA® 1000F LO Resins

Property	SMA 1000F	SMA 1000F LO
Appearance	Clear Flake	Clear Flake
Acid Number	475	475
Wt. % VOC (By GC Analysis)	0.8	0.3
Wt. % Non-Volatile Material	99.0	99.5
Molecular Weight (Mw By GPC)	5500	5500
Glass Transition Temp. (Tg, °C)	155	155
Clarity Of 20 Wt. % Aq. NH_4OH Solution	Clear @ 5 inches	Clear @ 5 inches

Oaklands Corporate Center, 502 Thomas Jones Way, Exton, PA 19341
Telephone 610-363-4100 Toll Free 800-345-8247 Fax 610-594-0252

ATOFIN

The Performance Of SMA® LO Resins

While the new process to produce SMA® LO Resins reduces the VOC content, it does not change the resins' properties or structures. Polymer properties such as acid number, molecular weight, glass transition temperature and solution viscosity are the same for SMA® Resins and the equivalent SMA® LO Resin grades, as illustrated by the comparison between SMA® 1000F and SMA® 1000F LO in the table. As such, the SMA® LO Resins are drop-in replacements, which continue to provide the same high level of performance to formulations which is expected from SMA® Resins. Furthermore, the product specifications for the SMA® LO Resins are, with one exception, exactly the same as those of the corresponding SMA® Resins. The exception being the percent of Non-Volatile Material (NVM) specification for the base resins which has been increased from 98 to 99% to reflect the extremely low VOC content of the LO grades.